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ABSTRACT

The nature of semantic roles and grammatical relations are explored from the perspective of Role and Reference Grammar (RRG). It is proposed that unraveling the relational aspects of grammar involves the recognition that semantic roles fall into two types, thematic relations and macroroles, and that grammatical relations are not universal and are not constituted in the same way in every language in which they exist. The concepts of thematic relations, semantic macroroles, and grammatical relations are explained, and evidence of cross-linguistic variation in grammatical relations is presented from a variety of languages including Acehnese, Zapotec, Walpiri, English, and Dyirbal. Implications for language acquisition and the analysis of child language are also discussed. (MSE)

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SEMANTIC ROLES AND GRAMMATICAL RELATIONS

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1. Introduction[1] Concepts like 'agent' and 'subject' figure prominently in discussions of child language and acquisition, and yet there are a number of important issues lurking in these terms. 'Agent' and 'patient', for example, are often used in two distinct senses: on some occasions, they are meant literally as the wilful instigator of an action and as the entity undergoing a change of state or condition, and on other occasions, they are used to denote the two primary arguments of a transitive predication, with 'agent' and 'patient' being cover terms of groups of distinct semantic roles which seem to function as 'logical subject' and 'logical object' of the verb. Grammatical relations, on the other hand, are often taken as unproblematically given. In this paper the nature of semantic roles and grammatical relations will be explored, as well as their interaction in language development. These issues will be investigated from the perspective of Role and Reference Grammar [RRG].[2]

2. Semantic roles Most syntactic theories assume some notion of semantic roles [SRs] but do not deal with basic questions which have remained unanswered since the original proposals of Fillmore and Gruber: what is the correct universal inventory of roles? what governs which role(s) a particular verb takes? Furthermore, there is the fundamental issue of the relation of SRs to GRs: is it universally predictable? The answers to the questions have important consequences for language acquisition, for the greater the degree of arbitrariness in the relationship between verbs and role(s) or between SRs and GRs, the more difficult the task facing the child is. The first step that RRG takes in answering these questions is to posit two types of SRs, corresponding roughly to the two senses of 'agent' and 'patient' mentioned in §1. They are termed 'thematic relations' and 'semantic macroroles'.

2.1 Thematic relations The question of the inventory of thematic relations [ThRs] in linguistic theory cannot be answered without a clarification of their function. In Fillmore's original theory, they had two functions: (1) they played a central role in the representation of the lexical meaning of verbs, e.g. '*open* [(A) (I) O]', and (2) they functioned in the statement of syntactic rules. Since most contemporary theories assume that syntax is autonomous, the second function is no longer relevant in them. ThRs serve only as a means of lexical representation in these theories, and it is this function that has led to disputes regarding the number of roles; if ThRs are representations of lexical meaning, then a large number will be required to express the great variety of verbal semantic contrasts.

RRG differs from other syntactic theories with respect to both of these points. It denies the autonomy of syntax, and therefore SRs play a direct role in syntax. On the other hand, ThRs have no direct role in the representation of lexical meaning. Rather, this is accomplished by means of the system of lexical decomposition put forth in Dowty 1979. Four classes of verbs are proposed, based on their inherent temporal properties or *Aktionsart*: states, activities, achievements, and accomplishments. Dowty provides syntactic and semantic tests for determining the class of a verb (see Dowty 1979:60). In the RRG system, states and activities are taken as primitive, and achievements and accomplishments are de-

[1]I would like to thank Nancy Budwig for organizing the session on 'agency' and inviting me to participate. This work was supported in part by a UC Davis Faculty Research Grant.

[2]See Van Valin 1990 for the most recent presentation of the theory, also Foley & Van Valin 1984; all of the aspects of RRG discussed in this paper are explicated in detail in these references.

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rived from the basic types by means of a limited set of operators and connectives. Examples of the decomposition are given in 1: (a) is a state, (b) an achievement, (c) an accomplishment, and (d) an activity.

(1) a.	The lamp is broken.	**broken**´ (the lamp)
b.	The lamp broke.	BECOME **broken**´ (the lamp)
c.	Bill broke the lamp.	[**do**´ (Bill)] CAUSE [BECOME **broken**´ (the lamp)]
d.	The lamp is shaking.	**shake**´ (the lamp)

These representations are significant because first, they represent a fundamentally different approach to lexical representation from lists of ThRs, and second, instead of the semantic representation of a verb being based on ThRs, ThRs are derived from the decompositions. Following Jackendoff 1976, ThRs are defined in terms of argument positions in lexical representations, e.g. 'patient' is the single argument of a state predicate (*the lamp* in 1a,b,c). Thus, in a theory in which the primary role of ThRs is in the syntax and not in the lexicon, only a small number of distinct ThRs need be posited. Moreover, because there are syntactic and semantic tests (which make no reference to ThRs) which determine the *Aktionsart* class of a verb and because the ThRs of a verb are function of its lexical representation, which is a function of its class, *the assignment of ThRs to verbs in RRG is independently motivated.*

The notion of 'agent' is generally considered one of the most important ThRs, but it is not in fact clear that it is of the same nature as the other ThRs. If ThRs are a lexical property of verbs, then they should be invariable in the different contexts in which a verb (with a specific *Aktionsart*) is used. But this is not the case, as the examples in 2 show.

(2) a. John (accidentally) killed his neighbor.
b. John (*accidentally) murdered his neighbor.

It is often assumed that both *kill* and *murder* take an agent argument, but if this is the case, then they both should not cooccur with an adverb like *accidentally* which contradicts the meaning of intended action which is a central component of agency. This prediction is correct only with *murder*; *kill* is compatible with a non-intentional, hence non-agentive, interpretation of its subject. This suggests strongly that the subject of *kill*, unlike that of *murder*, is not an agent but rather is what in RRG is called an EFFECTOR, the instigating, causing, effecting participant in a situation (*Bill* in 1c); this ThR is neutral with respect to intent and control. However, given that *John killed his neighbor* can be interpreted with *John* acting volitionally and intentionally, where does this interpretation of the subject as an agent come from, if not from the lexical semantic properties of the verb? It has long been argued that one of the ways to differentiate entailments which are inherent semantic properties of lexical items from pragmatic entailments is through the defeasibility test: if the meaning is defeasible or cancellable, then it is not an inherent semantic property but a pragmatic implication. The defeasibility of of the agentive interpretation of the subject in 2a indicates that it does not follow from the lexical meaning of *kill*, whereas the fact that it cannot be cancelled with *murder* signals that it is an inherent part of the verb's meaning. Holisky 1987 argues that for most activity and accomplishment verbs, the interpretation of their subject as agentive is a pragmatic implicature, based on the principle that human effectors are normally interpreted as agents, unless there is some explicit element (like *accidentally* in 2) that blocks the implicature. Thus 'agent' is not really a distinct ThR like effector, experiencer, theme, or patient; rather, it is an additional interpretation which is added to one of the basic ThRs. The subject of *murder* in 2b is an effector which obligatorily receives an agentive reading, while the subject of *kill* in 2a is an effector which optionally

gets this interpretation. Similarly, the subject of *see* is an experiencer, while that of *look at* is an agentive experiencer.

2.2 Semantic macroroles It was noted in §1 that 'agent' and 'patient' are often used to refer broadly to the two primary arguments in a transitive predication, the terms being applied to the arguments of both *kill* and *see* in this sense, even though the ThRs of these verbs are not the same. RRG captures this uses of these terms by positing a second type of SR, semantic macroroles [MRs]. There are only two MRs, actor and undergoer, and each of them subsumes a number of distinct ThRs. This is illustrated in 3 and 4.

(3) a. *Fred*$_{\text{ACTOR}}$ broke the clock$_{\text{UNDERGOER}}$. (Agent)
b. *The bomb*$_{\text{ACTOR}}$ shattered the windows$_{\text{UNDERGOER}}$. (Effector)
c. *Mary*$_{\text{ACTOR}}$ received a court summons$_{\text{UNDERGOER}}$. (Locative-Recipient)
d. *The farm animals*$_{\text{ACTOR}}$ sensed the coming storm$_{\text{UNDERGOER}}$. (Experiencer)
e. *John*$_{\text{ACTOR}}$ owns several Porsches$_{\text{UNDERGOER}}$. (Locative)

(4) a. Max$_{\text{ACTOR}}$ tossed *the keys*$_{\text{UNDERGOER}}$ to the policeman. (Theme)
b. The tidal wave$_{\text{ACTOR}}$ destroyed *the village*$_{\text{UNDERGOER}}$. (Patient)
c. The rock$_{\text{ACTOR}}$ hit *the door*$_{\text{UNDERGOER}}$. (Locative)
d. The thief$_{\text{ACTOR}}$ robbed *Larry*$_{\text{UNDERGOER}}$ of $25.00. (Locative-Source)
e. Bill$_{\text{ACTOR}}$ presented *Mary*$_{\text{UNDERGOER}}$ with a ring. (Locative-Recipient)

Each of the actors in 3 bears a different ThR, and yet they are all treated alike as the 'logical subject' of the sentence. A similar situation obtains in 4 with respect to undergoer; a range of distinct ThRs is treated alike as the 'logical object'. The prototypical actor is an agentive effector (the traditional 'agent'), and the prototypical undergoer is a patient. The relation between ThRs and MRs is expressed in the Actor-Undergoer Hierarchy in Figure 1. The ThRs in Table 1 can be ranked as more 'agent-like' and more 'patient-like' on a continuum, and in any clause, the argument bearing the ThR closest to the agent end of the continuum will be actor, while the one bearing the ThR closest to the patient end will be undergoer. Thus with *break* in 1c, the effector is actor and the patient undergoer, while with a verb like *see*, its experiencer will be actor and its theme undergoer.

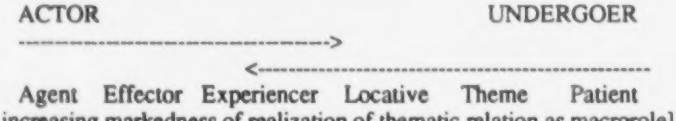

ACTOR
UNDERGOER
Agent Effector Experiencer Locative Theme Patient
['----->' = increasing markedness of realization of thematic relation as macrorole]

Figure 1

Macroroles play a central role in syntax in a monostratal theory like RRG. This becomes particularly clear in passive constructions. The simplest statement of passive in English is to say that the undergoer appears as subject, while the actor occurs as an oblique. The same groupings of ThRs illustrated in 3 and 4 function analogously in passives, as 5 illustrates. MRs are the interface between ThRs and GRs and are not equivalent to either. This can also be seen in 6.

(5) a. The clock$_{\text{UNDERGOER}}$ was broken by *Fred*$_{\text{ACTOR}}$.
b. The windows$_{\text{UNDERGOER}}$ were shattered by the *bomb*$_{\text{ACTOR}}$.
c. The coming storm$_{\text{UNDERGOER}}$ was sensed by the *farm animals*$_{\text{ACTOR}}$.
d. *The keys*$_{\text{UNDERGOER}}$ were tossed to the policeman by Max$_{\text{ACTOR}}$.
e. *The village*$_{\text{UNDERGOER}}$ was destroyed by the tidal wave$_{\text{ACTOR}}$.

f. *The door*$_{\text{UNDERGOER}}$ was hit by the rock$_{\text{ACTOR}}$.

(6) a. The girl [SUBJ, ACTOR] ran down the stairs.
b. The girl [SUBJ, UNDERGOER] got sick.

3. Grammatical relations What are GRs? How can a linguist determine whether the relations between a verb and its arguments in a language are syntactic rather than semantic? This is a question of major importance for the study of child language, for there has been considerable controversy over the issue of the nature of verb-argument relations in early child language.

A GR is defined by a restricted neutralization of SRs for syntactic purposes. As an example, let us consider whether the restrictions on which argument can appear as the subject[3] of *seem* in a raising construction in English are best described in terms of semantic or syntactic relations.

(7) a. Jean seems to be jogging in the park.
b. Jean seems to be sick.
c. Jean seems to be watching a movie.
d. *Jean$_i$ seems the police to have arrested ___$_i$.
e. Jean seems to have been arrested by the police.

In 7 an argument of the dependent clause appears in the matrix clause. There are restrictions on which argument can so appear, as the ungrammaticality of 7d shows, but the crucial question is whether the restriction is to be stated in syntactic or semantic terms. The raised argument is the actor of an intransitive verb in 7a and the actor of a transitive verb in 7c, and it is the undergoer of an intransitive verb in 7b and the undergoer of a transitive verb in 7e. In 7d the raised argument has the same MR as in the grammatical 7e example; this is crucial evidence that the restriction cannot be stated in semantic terms. There is thus a restricted neutralization of SRs with respect to which argument of the dependent clause functions as the raised NP in 7, and this neutralization defines a GR, in this case the traditional subject in English. It is significant that the contrast between actor and undergoer is neutralized with both intransitive verbs (7a,b) and transitive verbs (7c,e).

A language has GRs to the extent that it has restricted neutralizations of SRs for syntactic purposes, as exemplified in 7. It has generally been assumed that GRs are a universal feature of human language and that they are basically the same in all languages. Serious doubts, however, can be raised with respect to the universality of GRs. First, there is at least one language, Acehnese (Austronesian, Sumatra), in which there are no restricted neutralizations of SRs in the syntax and therefore no GRs. Durie 1985, 1987 has argued that the only verb-argument relations relevant to the description of Acehnese syntax are actor, undergoer, and 'argument of the verb', none of which are GRs. Second, languages vary with respect to the kind of restricted neutralizations that they have. In English the actor-undergoer contrast is neutralized with both intransitive and transitive verbs, but in many languages this contrast is neutralized only with intransitive verbs, never with transitive verbs. In such a language, the single argument of an intransitive verb can function as subject, regardless of whether it is actor or undergoer, but with a transitive verb only the actor may be subject. In a construction like 7 in such a language, both 7d and 7e would be ungrammatical. Examples of languages of this type include Lakhota (Siouan), Warlpiri (Australian Aboriginal), Zapotec (Oto-Manguean), and Enga (Papua-New Guinea). In languages like these, the restricted neutralization defining the subject GR differs significantly

[3]I am using the traditional terms for GRs in this discussion, despite the fact that RRG does not in fact employ them; this is to keep the amount of unfamiliar terminology to a minimum. See references in fn. 2.

from the one in languages like English, Dyribal, Malagasy and Italian. This is summarized in Table 2.

Cross-Linguistic Variation in Restricted Neutralization of Semantic Roles

	Intransitive Vs	Transitive Vs	Grammatical Relations
Acehnese	NO	NO	NO
Zapotec/Warlpiri	YES	NO	YES
English/Dyirbal	YES	YES	YES

Table 2

It should be noted further that there may be different restricted neutralizations in different constructions within a single language; this is the much discussed 'split-subject' phenomena found in a variety of languages (see Van Valin 1981). Thus, not only are GRs not universal, they are not constituted in the same way in all of the languages that have them.

This variation is in principle independent of two other major variables of GR systems. The first is the status of a language as ergative or accusative; English and Zapotec are thoroughly accusative, and Warlpiri and Dyirbal exhibit morphological ergativity. Languages may realize both options, as in split-ergative languages. The second is the extent to which discourse-pragmatic relations like topic are grammaticalized in GRs; that is, in some languages the subject is a clause-internal topic, and discourse-pragmatic factors play a crucial role in the selection of the argument to function as subject. In other languages, however, discourse-pragmatic factors have no effect on the selection of the subject argument, which is determined largely by lexical semantic factors. English, Dyirbal and Malagasy are examples of the first type of language, while Zapotec, Warlpiri and Swahili are examples of the second type. This second variable does correlate to a large extent with the issue of the type of restricted neutralization(s) found in a language. Most of the English/Dyirbal-type languages in Table 2 have subjects which are grammaticalized topics, but not all; Swahili is a significant exception. None of the Zapotec/ Warlpiri type have subjects which are grammaticalized topics. The reason for this is that discourse-pragmatic factors like topicality can affect subject selection only if there is more than one argument of the verb in the clause; if the verb has only one argument, then there is no choice as to which argument will be subject. Hence only with transitive verbs can there be a choice, and in order for there to be a choice, there must be a neutralization of the actor-undergoer opposition. This is what differentiates the Zapotec/Warlpiri type from the English/Dyirbal type: in the latter, either argument of a transitive verb can function as subject, whereas in the former only the actor may be subject. Since there is no choice in these languages, discourse-pragmatic considerations cannot affect subject selection. There are languages (e.g. Swahili) in which this neutralization exists but in which discourse-pragmatic factors do not influence subject selection (see Foley & Van Valin 1984). The contrast between the two types of language is captured in the two summaries of the RRG linking scheme in Figure 2.

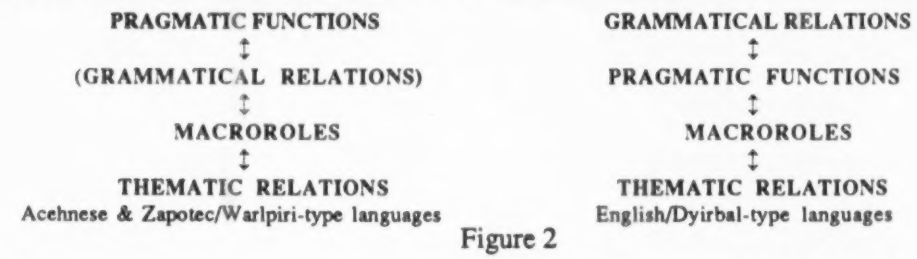


Figure 2

Pragmatic functions like topic play a role in determining GRs in English and Dyirbal, but

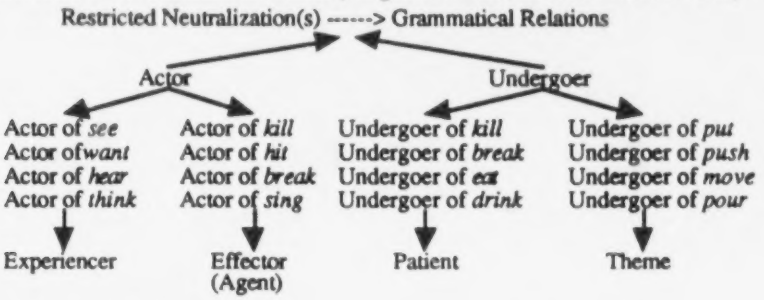
not in Zapotec and Warlpiri. Acehnese lacks GRs, and it can be included by making GRs optional in the first diagram. The means for signalling the discourse topicality of NPs is completely independent of the marking of SRs in this language; they are distinct subsystems in the grammar.

There are thus three major factors determining the GRs in a language: (1) the nature of the restricted neutralizations and how consistent they are in different constructions, (2) the pattern of association of the single argument of intransitive verbs with one of the arguments of a transitive verb, and how consistent this is across NP categories, tense-aspect series, etc., and (3) the extent to which discourse-pragmatic factors affect subject selection. GRs cannot be taken as unproblematically given.

4. Implications for acquisition The RRG theory of SRs and GRs has a number of implications for language acquisition and the analysis of child language. First, it makes possible alternative developmental sequences for the acquisition of GRs, as in Figure 3.

Potential Developmental Sequences for Semantic Roles and Grammatical Relations

(1) Thematic Relations ---- Semantic Bootstrapping---> Grammatical Relations
(2) Thematic Relations ---- Semantic Extension/Assimilation--> Grammatical Relations
(3) a. Macroroles -----> Grammatical Relations (via restricted neutralizations)
Macroroles -----> Thematic Relations (via generalization across classes of verbs)



b. Modified version of (2) above
Thematic Relations -----> Macroroles
Macroroles -----> Grammatical Relations (via restricted neutralizations)

Figure 3

The first two sequences assume that ThRs are linked directly to GRs. Sequence (1) is associated with Pinker 1984 and assumes GRs to be a part of the child's innate endowment; this assumption is dubious, for the reasons discussed in §3, and this calls the bootstrapping scheme into question. Sequence (2) is proposed by Schlesinger (e.g. 1988), and while it does not posit an innate set of GRs, it does not seriously address the problems raised by the diversity of GR systems in human languages; in particular, there are numerous languages in which subject cannot be not generalized from agent.

The contrast between ThRs and MRs affords a new possibility which is presented in sequence (3a): the child's entry into the system is at the level of MRs. This is the recognition of the basic contrast between doer of the action and non-doer of the action, which, in the prototypical case, is affected by the action. Braine & Hardy 1982 argue that there is no evidence for a GR 'subject' in early child language and that the relevant relation is not the specific ThR 'agent' but rather a more general SR of 'actor', which is very close to the MR actor. Specific ThRs follow from the awareness that the actor with a verb like *kill* or *hit* is different from that of *see* or *want* and that the undergoer with a verb like *kill* is differ-

ent from that with *push* or *put*. In the vast majority of human languages there is a level of GRs distinct from the SRs, and thus the child must also learn that these semantic distinctions can be neutralized in various ways (see Table 2), with the resulting relations being grammatical rather than purely semantic. Of the three possibilities in Table 2, the Zapotec/Warlpiri system is by far the most common in human languages, and therefore it would be reasonable to hypothesize that it represents the initial phase of the development of GRs by children. This is a very semantically oriented system, with subject selection in every case being determined by lexical semantic properties of the verb. Children learning the few languages like Acehnese must learn that there is in fact no restricted neutralization with intransitive verbs, whereas children learning languages like English and Malagasy must learn that MRs are also neutralized with transitive verbs as well. There is considerable evidence in support of this view; it is well known that the subject of transitive verbs in English is always the actor in early child language and that it is only much later that syntactic passives (in which the neutralization of MRs with transitive verbs is realized in English) are mastered. Children learning languages like English and Italian thus start out with a Zapotec/Warlpiri-type system of GRs.[4] It should be noted that the distinction between ThRs and MRs does not necessarily entail that MRs be the starting point into the system; sequence (3b) represents a modified version of (2) in which ThRs are generalized to MRs via semantic assimilation, and then MRs are generalized to GRs. Only empirical research will reveal which of these possible sequences, or combination of sequences, yields the best account.

The considerations regarding GRs in §3 show that they cannot simply be taken as universal and innate; rather, given the variation in GRs across languages, they must be learned, and the child must sort out the relative contributions of SRs and discourse-pragmatic factors to the constitution of GRs in the language being learned. The range of mappings among grammatical forms, SRs, and discourse-pragmatic relations predicts variation both within languages and across languages in acquisition, and from an RRG perspective the crucial question is: how directly are the semantic and discourse-pragmatic functions of arguments coded in morphosyntax? Where there are clear-cut one-to-one mappings between form and function, these should be acquired earlier and with the least amount of trouble. Rispoli 1990 explores this issue with respect to grammatical phenomena in Turkish, Hebrew, Kaluli and Italian and shows this to be the case. With respect to the languages discussed here, Acehnese children should master the systems of SRs and discourse-pragmatic relations sooner and with fewer problems than English children, because the two systems are conflated in English but kept distinct and coded directly in Acehnese. Problems will arise for English children when, having learned that sentence-initial position normally codes both actor and higher topicality, they try to indicate the higher topicality of a non-actor. At this point they must master the restricted neutralization with transitive verbs and the grammaticalization of topicality in the English subject GR. For an Acehnese child no such problem will exist, because the actor-coding and topicality-coding devices are fully separate and independent. Similarly, children learning Zapotec and Lakhota would also not face this problem, since discourse-pragmatic relations are not part of the GR system; distinct mechanisms are used for signalling topicality. Sesotho children are presented with a

[4]This undermines the argument made in Hyams 1986 about the nature of GRs in child language. She shows that intransitive verbs in Italian agree with their single argument regardless of its ThR, and argues that this proves that "grammatical agreement is a strictly formal process which holds between what is traditionally referred to as 'subject' and 'verb'."(138) While it is true that agreement is not sensitive to SRs, as in Acehnese, her conclusion is false, if by 'subject' she means the same notion of subject as in adult Italian. The children at the stage she presents have only the Zapotec/Warlpiri system; that is, MRs are neutralized only with intransitive verbs, unlike adult Italian, in which there are restricted neutralizations with both transitive and intransitive verbs, just as in English. Thus the evidence that she cites shows only that Italian children do not have an Acehnese-like system, not that they have the same GR system as adult Italian speakers.

rather different situation, according to Demuth 1989, 1990. The direct form-function correlation presented to them is preverbal position and definiteness-high topicality, not preverbal position and actor, as in English, and moreover children are exposed to a high frequency of passive constructions very early on, due to this correlation. Because a preverbal NP must be presupposed and definite, the only way to form a WH-question when the question word is the actor of a transitive verb is to use a passive. Hence simple questions like 'Who ate this?' or 'Who hit you?' require the use of the passive in Sesotho. In English, in contrast, there is no construction in a simple clause which requires the use of a passive construction. Sesotho children are thus confronted with a direct form-function correlation and a high frequency of passive constructions related to this correlation, and therefore they should learn the discourse-pragmatic aspects of clause structure simultaneously with the role-coding system, thereby predicting early mastery of the voice system that permits different arguments to occur as subject in a clause. Demuth shows that this is in fact what occurs.

Thus, unraveling the acquisition of the relational aspects of grammar involves the recognition that semantic roles fall into two types, thematic relations and macroroles, and that grammatical relations are not simple universal primitives but rather are not universal and are not constituted in the same way in every language that has them.[5]

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